


The '275 Patent	Lenovo Laptops and Tablets
Claim 1	
<p>1. A system for remote patching of operating code located in a mobile unit, comprising:</p> <p>a manager host operable to initiate transmission through a wireless communication network of at least one discrete patch message defining at least one patch;</p>	<p>Lenovo manufactures computer laptops and tablets, such as the Ideatab line of tablets and ThinkPad line of laptops. Lenovo uses various servers to deliver and install over-the-air operating code updates to laptops and tablets. Communications between Lenovo's laptops/tablets and the servers may be facilitated through Wi-Fi and/or cellular networks connected to the Internet.</p> <p>Lenovo remotely upgrades the operating software for its laptops/tablets. Lenovo stores these software updates on servers that distribute the updates to the laptops/tablets. The servers initiate transmission of the update package. Factors such as the size, connection speed, and number of updates will determine how many updates or patches are transmitted.</p> <div> <p>Lenovo IdeaTab A2107 - Black</p>  </div>

	<table><tr><td colspan="2">Wireless Technology</td></tr><tr><td>3G - HSPA</td><td>850/1900MHz</td></tr><tr><td>GSM/GPRS/EDGE</td><td>GSM (850/1900MHz)</td></tr><tr><td>Wi-Fi® connectivity</td><td>802.11 b/g/n dual band</td></tr><tr><td>Bluetooth® technology</td><td>3.0</td></tr><tr><td>FOTA capable</td><td>Upgrade Firmware Over The Air</td></tr></table>	Wireless Technology		3G - HSPA	850/1900MHz	GSM/GPRS/EDGE	GSM (850/1900MHz)	Wi-Fi® connectivity	802.11 b/g/n dual band	Bluetooth® technology	3.0	FOTA capable	Upgrade Firmware Over The Air
Wireless Technology													
3G - HSPA	850/1900MHz												
GSM/GPRS/EDGE	GSM (850/1900MHz)												
Wi-Fi® connectivity	802.11 b/g/n dual band												
Bluetooth® technology	3.0												
FOTA capable	Upgrade Firmware Over The Air												

ThinkVantage System Update 5.03 for Windows 8.1 (32-bit, 64-bit), 8 (32-bit, 64-bit), 7 (32-bit, 64-bit) - Desktop, Notebook, Workstation

Name	Operating System	Version	Released	Add to download list	Download now
System Update 5.03 systemupdate503-2013-10-31.exe 11.25 MB	Windows 7 32bit, Windows 7 64bit, Windows 8 32bit, Windows 8 64bit, Windows 8.1 32-bit, Windows 8.1 64-bit,	5.03.0008	23 Jan 2014		
System Update 5.03 systemupdate503-2013-10-31.bt 12.6 KB	Windows 7 32bit, Windows 7 64bit, Windows 8 32bit, Windows 8 64bit, Windows 8.1 32-bit, Windows 8.1 64-bit,	5.03.0008	23 Jan 2014		

Note for ThinkPad X1 Carbon users:
This document supports both X1 Carbon (Type 3443, 3444, 3446, 3448, 3460, 3462, 3463) and X1 Carbon (Type 20A7, 20A8).
To find your X1 Carbon Type, please [click here for more details](#).

System Update downloads data updates for software, drivers and BIOS from a Lenovo server directly over the Internet without requiring specific user knowledge of where the package is located or if it is needed by the target system.

Other ways in which ThinkVantage Technologies help you keep your system up to date and secure are:

- Provides a direct connection to Lenovo Service and Support for ThinkPad and ThinkCentre drivers, software and BIOS updates.
- Helps maximize your system performance and minimize security vulnerability.

Microsoft .NET Framework version 3.5 with Service pack 1 or above is required for System Update to work Correctly. Use Microsoft Windows Update to ensure that Microsoft .NET Framework 3.5 SP1 or above is installed on your system.

New for this release

- Change default setting of Schedule Updates to "Automatically download and install Critical updates"

System Update general features include:

- Active Directory support
- HTTP basic and NTLM proxy authentication support
- Silent script support
- Ability to easily identify applicable software, hardware, and solution offerings from Lenovo that can help you keep your maximize your computer performance
- Ability to scan updates from external media, local hard drive, or network location
- Direct connection to Lenovo Service and Support or a local repository configured by IT administrator for available Lenovo drivers, software, and BIOS updates
- Integration with other Lenovo applications, such as Rescue and Recovery, Client Security Solution, System Migration Assistant, and Access Connections

System Update administrator features include:

- Ability to modify and create custom update packages compatible with System Update, using Package Builder.
- Ability to create and manage a local repository, using Update Retriever.
- Ability to import custom packages and to retrieve updates from the Lenovo support site, using Update Retriever.
- Ability to customize System Update using ADM files and registry settings Administrator tools for System Update are available for on the [Administrator Tools](#) page.

[Exemplary Source: <http://www.att.com/shop/wireless/devices/lenovo/ideatab-a2107-black.html#fbid=a9sNo2E7WLB>; http://support.lenovo.com/en_US/downloads/detail.page?&LegacyDocID=MIGR-73695]

a first mobile unit operable to receive the at least one discrete patch message, the first mobile unit further operable to create patched operating code by merging the at least one patch with current operating code located in the first mobile unit and to switch execution to the patched operating code; and

Lenovo laptops/tablets are operable to receive patch messages from the servers described above. Lenovo updates each laptop/tablet's software by merging the existing code with the changes defined in the patch in order to fix bugs and add new features. Once the software has been updated, the patch initiates the laptop/tablet to begin using the new version of software.

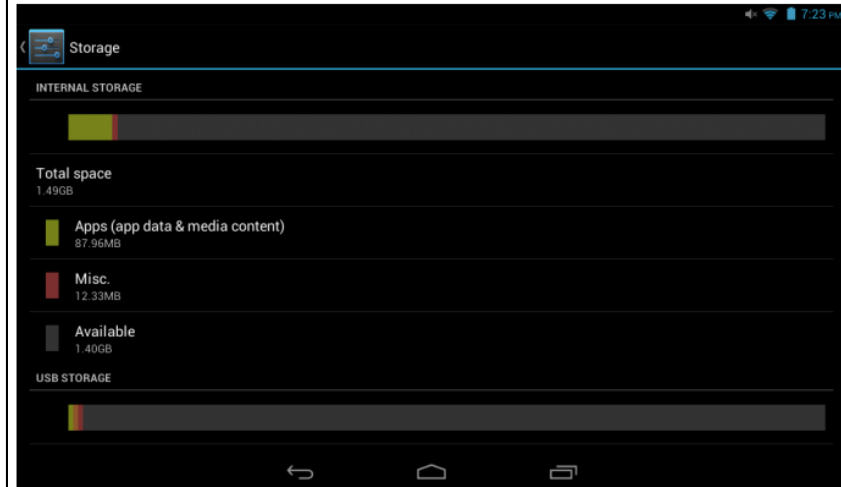
Lenovo Ideatab A1000 receives software update, improves internal storage

Posted on Aug 7 2013 - 9:45pm by [Kevin Shen](#)

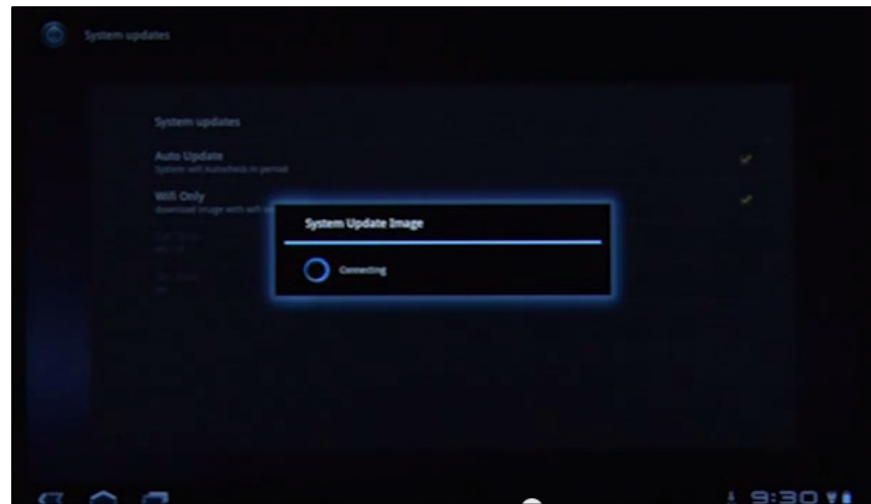
« PREVIOUS | NEXT »

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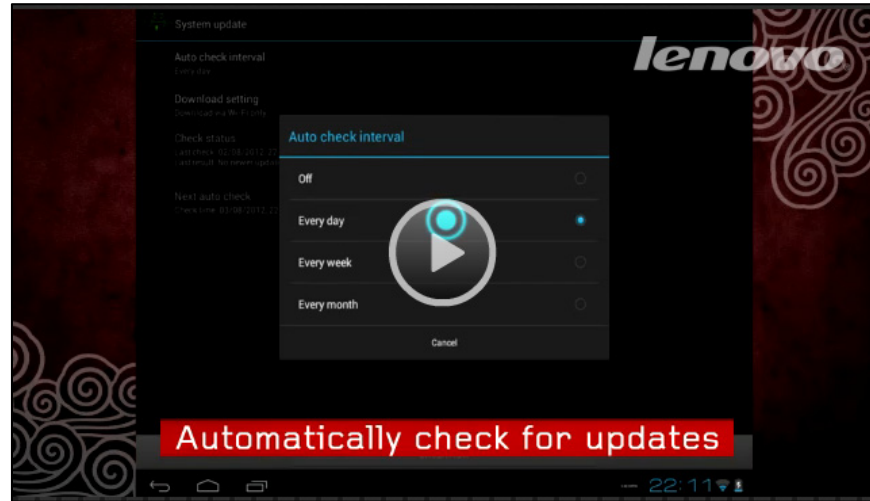


Owners of the Lenovo Ideatab A1000 should check their tablet for a system update now, as Lenovo has rolled out an update to fix the internal storage mishaps that many early adopters have been experiencing. Out of the box, users were reporting that they only had 512MB of available internal storage, something that shouldn't happen with a 16GB tablet.



[Exemplary Sources: [file:///F:/My Documents/Iron Oak/ASUS FOTA.pdf](file:///F:/My%20Documents/Iron%20Oak/ASUS%20FOTA.pdf);
<http://thedroidguy.com/2013/08/lenovo-ideatab-a1000-receives-software-update-improves-internal-storage/>; <http://mobilesupport.lenovo.com/us/en/products>

	/s2109_tablet/video/VID074738 ; http://www.youtube.com/watch?v=tDfY8Y9lv7A ; http://www.att.com/shop/wireless/devices/lenovo/ideatab-a2107-black.html#fbid=a9sNo2E7WLB ; http://support.lenovo.com/en_US/downloads/detail.page?&LegacyDocID=MIGR-73695]
a second mobile unit operable to receive the at least one discrete patch message, the second mobile unit further operable to create patched operating code by merging the at least one patch with current operating code located in the second mobile unit and to switch execution to the patched operating code; and	See the previous limitation.
wherein the manager host is further operable to address the at least one discrete patch message such that the at least one discrete patch message is transmitted to the first mobile unit but not to the second mobile unit.	The servers compare the version number of the software running on the laptop/tablet to the version of the most recent patch. The servers used by Lenovo then initiate patch transmissions to those laptops/tablets that do not have the current version of the patch. The servers will only initiate transmission of upgrade patches to the laptops/tablets with outdated software.



[Exemplary Source: http://mobilesupport.lenovo.com/us/en/products/s2109_tablet/video/VID074738]

The '658 Patent	Lenovo Laptops and Tablets																								
Claim 1																									
<p>1. An apparatus for automatically selecting one of a plurality of communication paths, the apparatus comprising:</p> <p>a memory operable to store a plurality of ordered lists of communication paths, each ordered list associated with one of a plurality of communication attributes, each communication attribute representing a separate priority for communication; and</p>	<p>Lenovo’s laptops automatically select communication paths on wired, cellular, and Wi-Fi networks and Lenovo’s tablets automatically select communication paths on cellular and Wi-Fi networks.</p> <p>Lenovo’s laptops and tablets contain memory allowing them to store ordered lists of communication paths on wired Ethernet, Wi-Fi, and/or cellular networks. Each of these ordered lists is associated with a communication attribute (such as the type of network or the speed of the communication). Moreover, each communication attribute represents a separate priority for communication (e.g., “home” Wi-Fi networks).</p> <p>For example, the Lenovo ThinkPad laptops are a portable computers that contains memory operable to store ordered lists of communication paths.</p> <div><table><tr><th>Models</th><th>Features</th><th>Reviews</th><th>Tech Specs</th></tr><tr><td colspan="4">ThinkPad T440 Tech Specs</td></tr><tr><td colspan="4">User Guide</td></tr><tr><td>WiFi</td><td colspan="3"><ul style="list-style-type: none">Intel® Centrino® 7260 (Wilkins Peak 2 AC) 2x2 AC+ BT 4.0ThinkPad Wireless 2x2 BGN+BT 4.0</td></tr><tr><td>Ethernet</td><td colspan="3">RJ45</td></tr><tr><td colspan="2">Memory</td><td colspan="2">4 / 8 / 12 GB</td></tr></table></div>	Models	Features	Reviews	Tech Specs	ThinkPad T440 Tech Specs				User Guide				WiFi	<ul style="list-style-type: none">Intel® Centrino® 7260 (Wilkins Peak 2 AC) 2x2 AC+ BT 4.0ThinkPad Wireless 2x2 BGN+BT 4.0			Ethernet	RJ45			Memory		4 / 8 / 12 GB	
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The '658 Patent	Lenovo Laptops and Tablets										
	<div> <table> <tr> <td>ThinkPad Tablet 2</td><td>Tech Specs</td></tr> <tr> <td colspan="2">Tablet 2 User Guide</td></tr> </table> </div> <div> <table> <tr> <td>WLAN / Mobile Broadband</td><td> <ul style="list-style-type: none"> 802.11 a/b/g/n Gobi 4000 (LTE /HSPA+) - Available in US with select models and AT&T only. Bluetooth® 4.0 </td></tr> </table> </div> <p>Lenovo's laptops and tablets select one of the communication paths based on the type, speed, and/or cost of the communication. For example, the ThinkPad T440 and ThinkPad Tablet 2 choose the appropriate path for the communication of data based on network availability. The T440 will generally choose wired networks in order to save on data transmission costs and increased speed. Similarly, the Tablet 2 will generally choose Wi-Fi networks in order to save on data transmission costs and increased speed.</p> <p>When a wired connection is not available, Lenovo's laptops use the user's preferred Wi-Fi networks. The laptops store multiple Wi-Fi access points, allowing the unit to automatically connect to authenticated access points when available. Similarly, when a Wi-Fi connection is not available to a tablet, Lenovo's tablets may use various cellular networks throughout the country.</p> <div> <table> <tr> <td>WLAN</td><td> <ul style="list-style-type: none"> 802.11 a/b/g/n Bluetooth® 4.0 </td></tr> <tr> <td>WWLAN</td><td>Gobi 4000 (LTE /HSPA+) (available in US only with selected models and AT&T only)</td></tr> </table> </div> <p>The Lenovo ThinkPad 2 requires a SIM card for wireless broadband operation. The SIM card incorporates a memory, organized in a directory structure at the lowest level of which individual files, known as "Elementary Files" ("EF"s) are stored according to 3GPP TS 11.11 (and its successor standard 3GPP TS31.102). These standards apply to 2G/3G service as supported by the ThinkPad 2.</p>	ThinkPad Tablet 2	Tech Specs	Tablet 2 User Guide		WLAN / Mobile Broadband	<ul style="list-style-type: none"> 802.11 a/b/g/n Gobi 4000 (LTE /HSPA+) - Available in US with select models and AT&T only. Bluetooth® 4.0 	WLAN	<ul style="list-style-type: none"> 802.11 a/b/g/n Bluetooth® 4.0 	WWLAN	Gobi 4000 (LTE /HSPA+) (available in US only with selected models and AT&T only)
ThinkPad Tablet 2	Tech Specs										
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The '658 Patent**Lenovo Laptops and Tablets****2 SIM card slot**

Open the cover to access the Subscriber Identification Module (SIM) card slot. Insert a SIM card to establish a wireless Wide Area Network (WAN) connection. For instructions on how to install the SIM card, see "Installing the SIM card" on page 11.

3GPP TS 11.11 version 8.14.0 Release 1999

23

ETSI TS 100 977 V8.14.0 (2007-06)

6 Logical Model

This clause describes the logical structure for a SIM, the code associated with it, and the structure of files used.

6.1 General description

Figure 3 shows the general structural relationships which may exist between files. The files are organized in a hierarchical structure and are of one of three types as defined below. These files may be either administrative or application specific. The operating system handles the access to the data stored in different files.

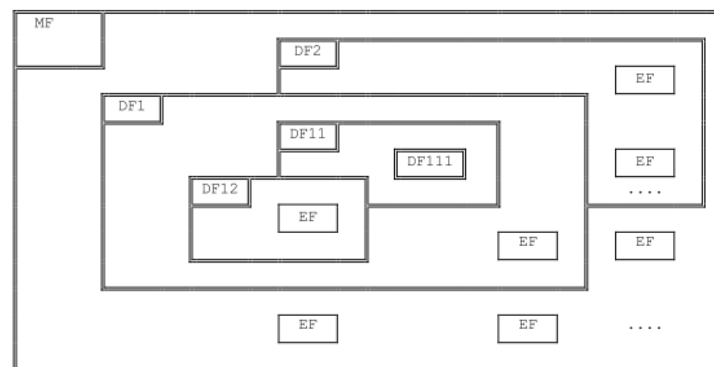


Figure 3: Organization of memory

Files are composed of a header, which is internally managed by the SIM, and optionally a body part. The information of the header is related to the structure and attributes of the file and may be obtained by using the commands GET RESPONSE or STATUS. This information is fixed during the administrative phase. The body part contains the data of the file.

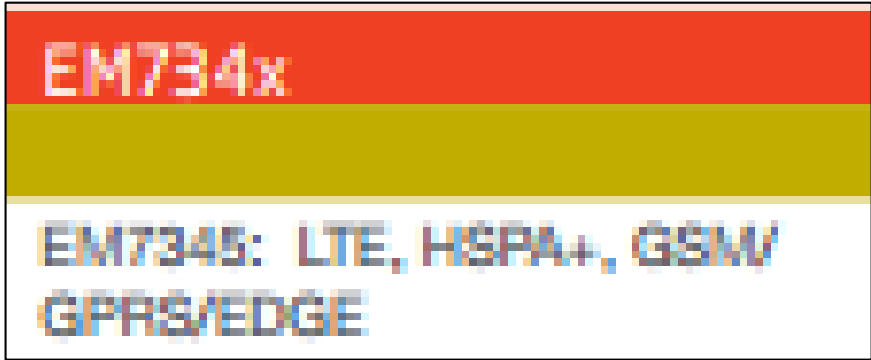
The '658 Patent	Lenovo Laptops and Tablets																																									
	<p>An Elementary File referred to as EF_{PLMNsel} contains an ordered list of at least 8 preferred mobile networks in order of priority, based on the Mobile Network Code (MNC) attribute of each network (section 10.3.4 of TS 11.11)</p> <div><p>10.3.4 EF_{PLMNsel} (PLMN selector)</p><p>This EF contains the coding for n PLMNs, where n is at least eight. This information determined by the user/operator defines the preferred PLMNs of the user in priority order.</p><table><tr><td>Identifier: '6F30'</td><td>Structure: transparent</td><td>Optional</td></tr><tr><td>File size: 3n (n ≥ 8) bytes</td><td colspan="2">Update activity: low</td></tr><tr><td colspan="3">Access Conditions:</td></tr><tr><td>READ</td><td>CHV1</td><td></td></tr><tr><td>UPDATE</td><td>CHV1</td><td></td></tr><tr><td>INVALIDATE</td><td>ADM</td><td></td></tr><tr><td>REHABILITATE</td><td>ADM</td><td></td></tr><tr><td>Bytes</td><td>Description</td><td>M/O</td><td>Length</td></tr><tr><td>1 to 3</td><td>1st PLMN (highest priority)</td><td>M</td><td>3 bytes</td></tr><tr><td>22 to 24</td><td>8th PLMN</td><td>M</td><td>3 bytes</td></tr><tr><td>25 to 27</td><td>9th PLMN</td><td>O</td><td>3 bytes</td></tr><tr><td>(3n-2) to 3n</td><td>nth PLMN (lowest priority)</td><td>O</td><td>3 bytes</td></tr></table></div> <p>Home networks are defined in the “HPLMN Selector” file, which identifies networks according to different access technologies in priority order (section 10.3.37 of 3GPP TS 11.11).</p> <div><p>10.3.37 EF_{HPLMNwAcT} (HPLMN Selector with Access Technology)</p><p>The HPLMN Selector with access technology data field shall contain the HPLMN code, or codes together with the respective access technology in priority order (see TS 23.122 [51]).</p></div> <p>A further EF, EF_{PLMNwAcT}, contains a further priority-ordered list of networks with associated network access technology attributes (section 10.3.35).</p>	Identifier: '6F30'	Structure: transparent	Optional	File size: 3n (n ≥ 8) bytes	Update activity: low		Access Conditions:			READ	CHV1		UPDATE	CHV1		INVALIDATE	ADM		REHABILITATE	ADM		Bytes	Description	M/O	Length	1 to 3	1 st PLMN (highest priority)	M	3 bytes	22 to 24	8 th PLMN	M	3 bytes	25 to 27	9 th PLMN	O	3 bytes	(3n-2) to 3n	nth PLMN (lowest priority)	O	3 bytes
Identifier: '6F30'	Structure: transparent	Optional																																								
File size: 3n (n ≥ 8) bytes	Update activity: low																																									
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READ	CHV1																																									
UPDATE	CHV1																																									
INVALIDATE	ADM																																									
REHABILITATE	ADM																																									
Bytes	Description	M/O	Length																																							
1 to 3	1 st PLMN (highest priority)	M	3 bytes																																							
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The '658 Patent	Lenovo Laptops and Tablets
	<div style="border: 1px solid black; padding: 5px;"> <p>10.3.35 EF_{PLMNwAcT} (User controlled PLMN Selector with Access Technology)</p> <p>This EF contains coding for n PLMNs, where n is at least eight. This information, determined by the user, defines the preferred PLMNs of the user in priority order. The EF also contains the Access Technologies for each PLMN in this list. (see TS 23.122 [51]).</p> </div> <p>[Exemplary Sources: http://shop.lenovo.com/us/en/laptops/thinkpad/t-series/t440/#techspecs; http://shop.lenovo.com/us/en/tablets/thinkpad/thinkpad-tablet-2/#techspecs; http://www.lenovo.com/shop/americas/content/user_guides/tablet2 Ug_en.pdf; http://www.etsi.org/deliver/etsi_ts/100900_100999/100977/08.14.00_60/ts_100977v081400p.pdf]</p>
<p>a processor operable to receive a request for communication, the request indicating a communication attribute, the processor further operable to automatically select a communication path from an ordered list associated with the indicated communication attribute.</p>	<p>Lenovo's laptops and tablets contain processors operable to receive communication requests from their users. For example, the T440 contains a processor and antenna. The T440's processor and antenna communicate with Wi-Fi and wired networks after receiving communication requests from the user. Similarly, the Tablet 2 contains a processor and antenna. The Tablet 2's processor and antenna communicate with Wi-Fi and cellular networks after receiving communication requests from the user.</p> <p>The communication requests received by the processors in Lenovo's laptops and tablets include the appropriate communication attributes based on the type of request. For example, the tablets use cellular communication when Wi-Fi is not available.</p> <p>Lenovo's laptops and tablets, based on the type of request and available paths, automatically select the most suitable communication path. The laptop or tablet determines the appropriate communication path based on an ordered list of paths, using factors such preferred cellular networks, authenticated Wi-Fi networks, and wired networks.</p>

The '658 Patent	Lenovo Laptops and Tablets
	<p>Support for automatic selection of a cellular network is mandated in standard 3GPP TS 23.122 – see section 3.1. If cellular data is enabled in the laptop or tablet, it will seek to establish a data connection. The highest priority accessible network is automatically selected.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>3.1 PLMN selection and roaming</p> <p>The MS normally operates on its home PLMN (HPLMN) or equivalent home PLMN (EHPLMN). However a visited PLMN (VPLMN) may be selected, e.g., if the MS loses coverage. There are two modes for PLMN selection:</p> <ul style="list-style-type: none"> i) Automatic mode - This mode utilizes a list of PLMNs in priority order. The highest priority PLMN which is available and allowable is selected. ii) Manual mode - Here the MS indicates to the user which PLMNs are available. Only when the user makes a manual selection does the MS try to obtain normal service on the VPLMN. </div> <p>TS22.011 describes the operation of the ThinkPad 2 when registering onto a network (PLMN) for service. Section 3.2.2.1 describes the use of the various ordered lists contained in the operator controlled PLMN list, the use controlled PLMN list and the Home PLMN list.</p>

The '658 Patent	Lenovo Laptops and Tablets
	<div style="border: 1px solid black; padding: 10px;"> <p>3.2.2 Procedures</p> <p>3.2.2.1 General</p> <p>In the following procedures the UE selects and attempts registration on PLMNs.</p> <p>In this TS, the term "PLMN Selection" defines an UE based procedure, whereby candidate PLMNs are chosen, one at a time, for attempted registration.</p> <p>A User Controlled PLMN Selector data field exists on the USIM to allow the user to indicate a preference for network selection. It shall be possible for the user to update the User Controlled PLMN Selector data field, but it shall not be possible to update this data field over the radio interface, e.g. using SIM Application Toolkit.</p> <p>It shall be possible to have an Operator Controlled PLMN Selector list and a User Controlled PLMN Selector list stored on the SIM/USIM card. Both PLMN Selector lists may contain a list of preferred PLMNs in priority order. It shall be possible to have an associated Access Technology identifier e.g., E-UTRAN, UTRAN, or GERAN associated with each entry in the PLMN Selector lists.</p> <p style="text-align: center;"><i>ETSI</i></p> <hr/> <p>3GPP TS 22.011 version 11.3.0 Release 11 10 ETSI TS 122 011 V11.3.0 (2013-04)</p> <p>The UE shall utilise all the information stored in the USIM related to network selection, e.g. HPLMN, Operator controlled PLMN Selector list, User Controlled PLMN Selector list, Forbidden PLMN list.</p> <p>Note 1: A PLMN in a Selector list, including HPLMN, may have multiple occurrences, with different access technology identifiers.</p> </div> <p>In addition to the cellular functionality, the ThinkPad 2 has certified capability to access Wi-Fi networks complying with IEEE standards (802.11 a/b/g/n/ac). The particular communication path is selected from an ordered list according to the best available network connection.</p> <p>Additionally the ThinkPad 2 stores network identities and associated security attributes of Wi-Fi (802.11 a/b/g/n/ac) networks that have been accessed previously and automatically connects. The ThinkPad 2 connects to the most recently used secured network if more than one is available, or to the next most recent if the first is not available (and so on).</p>

The '658 Patent	Lenovo Laptops and Tablets				
	<table border="1"> <tr> <td>WLAN</td><td> <ul style="list-style-type: none"> ◦ 802.11 a/b/g/n ◦ Bluetooth® 4.0 </td></tr> <tr> <td>WWLAN</td><td>Gobi 4000 (LTE /HSPA+) (available in US only with selected models and AT&T only)</td></tr> </table> <p>[Exemplary Sources: http://shop.lenovo.com/us/en/laptops/thinkpad/t-series/t440/#techspecs; http://shop.lenovo.com/us/en/tablets/thinkpad/thinkpad-tablet-2/#techspecs; http://www.gtc.jp/3GPP/Specs/23122-8c0.pdf; http://www.etsi.org/deliver/etsi_ts/122000_122099/122011/11.02.00_60/ts_122011v110200p.pdf]</p>	WLAN	<ul style="list-style-type: none"> ◦ 802.11 a/b/g/n ◦ Bluetooth® 4.0 	WWLAN	Gobi 4000 (LTE /HSPA+) (available in US only with selected models and AT&T only)
WLAN	<ul style="list-style-type: none"> ◦ 802.11 a/b/g/n ◦ Bluetooth® 4.0 				
WWLAN	Gobi 4000 (LTE /HSPA+) (available in US only with selected models and AT&T only)				

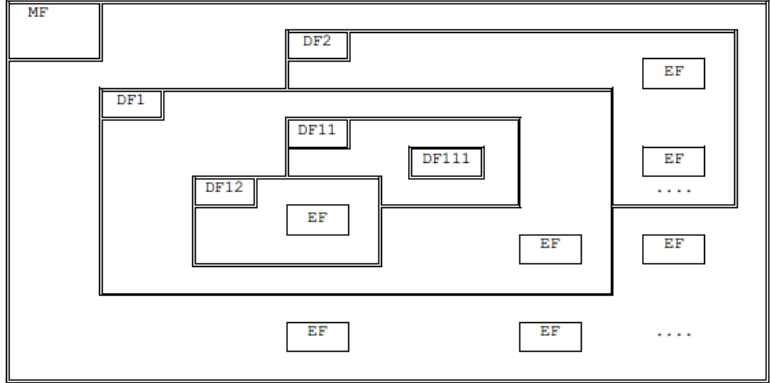
The '202 Patent	Lenovo Laptops and Tablets with 3G Connectivity				
Claim 8					
<p>8. A mobile unit for communicating using a cellular telephone network, comprising:</p> <p>a communication device operable to receive a system identification number list from a host controller remotely disposed from the mobile unit;</p>	<p>Lenovo's laptops and tablets, such as the ThinkPad 10, communicate data information using a cellular telephone network. The Lenovo laptops and tablets receive a system identification number list from a host controller remotely disposed from the mobile smart phone.</p> <div> <table border="1"> <tr> <td>ThinkPad 10</td><td>Tech Specs</td></tr> <tr> <td>Connectivity</td><td> <ul style="list-style-type: none"> ◦ WiFi 802.11 a/b/g/n ◦ Bluetooth 4.0 ◦ Sierra EM7345 LTE </td></tr> </table> <div>  <p>EM734x</p> <p>EM7345: LTE, HSPA+, GSM/GPRS/EDGE</p> </div> </div> <p>Lenovo's tablets, such as the ThinkPad 10, are communication devices that use the Global System for Mobile (GSM) cellular networks. The Levovo laptops and tablets receive an</p>	ThinkPad 10	Tech Specs	Connectivity	<ul style="list-style-type: none"> ◦ WiFi 802.11 a/b/g/n ◦ Bluetooth 4.0 ◦ Sierra EM7345 LTE
ThinkPad 10	Tech Specs				
Connectivity	<ul style="list-style-type: none"> ◦ WiFi 802.11 a/b/g/n ◦ Bluetooth 4.0 ◦ Sierra EM7345 LTE 				

The '202 Patent	Lenovo Laptops and Tablets with 3G Connectivity
	<p>identification number list referred to as an Elementary File (EF) from Fujitsu's servers with coding for preferred and prioritized Public Land Mobile Networks (PLMNs).</p> <p>Lenovo's laptops and tablets operate on 3G and 4G cellular networks, and thus adhere, inter alia, to the 3GPP standards. The 3GPP standards mandate the storage and maintenance of lists of preferred mobile networks identified using a mobile network code (MNC).</p> <p>When roaming, preferred networks are identified in the "PLMN selector" file (section 10.3.4 of 3GPP TS11.11). Home networks are defined in the "HPLMN Selector" file, which identifies networks according to different access technologies in priority order (section 10.3.37 of 3GPP TS 11.11).</p> <div style="border: 1px solid black; padding: 2px; margin: 10px auto; width: fit-content;"> Elementary File (EF): file containing access conditions and data and no other files. </div> <div style="border: 1px solid black; padding: 2px; margin: 10px auto; width: fit-content;"> PLMN Public Land Mobile Network </div>

The '202 Patent	Lenovo Laptops and Tablets with 3G Connectivity																																																	
	<div><div><div><div><div>10.3.4</div><div>EF_{PLMNsel} (PLMN selector)</div></div><div><div>This EF contains the coding for n PLMNs, where n is at least eight. This information determined by the user/operator defines the preferred PLMNs of the user in priority order.</div><div><table><tr><td>Identifier: '6F30'</td><td>Structure: transparent</td><td>Optional</td></tr><tr><td>File size: 3n (n ≥ 8) bytes</td><td colspan="2">Update activity: low</td></tr><tr><td colspan="3">Access Conditions:</td></tr><tr><td>READ</td><td>CHV1</td><td></td></tr><tr><td>UPDATE</td><td>CHV1</td><td></td></tr><tr><td>INVALIDATE</td><td>ADM</td><td></td></tr><tr><td>REHABILITATE</td><td>ADM</td><td></td></tr><tr><td>Bytes</td><td>Description</td><td>M/O</td><td>Length</td></tr><tr><td>1 - 3</td><td>1st PLMN (highest priority)</td><td>M</td><td>3 bytes</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>22 - 24</td><td>8th PLMN</td><td>M</td><td>3 bytes</td></tr><tr><td>25 - 27</td><td>9th PLMN</td><td>O</td><td>3 bytes</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>(3n-2)-3n</td><td>nth PLMN (lowest priority)</td><td>O</td><td>3 bytes</td></tr></table></div><div><div><div>- PLMN</div><div>Contents:</div><div>Mobile Country Code (MCC) followed by the Mobile Network Code (MNC).</div></div></div></div></div></div><div><div><div><div>10.3.37</div><div>EF_{HPLMNwAcT} (HPLMN Selector with Access Technology)</div></div><div><div>The HPLMN Selector with access technology data field shall contain the HPLMN code, or codes together with the respective access technology in priority order (see TS 23.122 [51]).</div></div></div></div><div>The same standard further mandates a “forbidden” network list. This contains a list of networks which the module “shall not automatically attempt to access”.</div><div><div><div>3GPP TS 11.11 version 8.14.0 Release 1999</div><div>66</div><div>ETSI TS 100 977 V8.14.0 (2007-06)</div></div><div><div><div>10.3.16</div><div>EF_{FPLMN} (Forbidden PLMNs)</div></div><div><div>This EF contains the coding for four Forbidden PLMNs (FPLMN). It is read by the ME as part of the SIM initialization procedure and indicates PLMNs which the MS shall not automatically attempt to access.</div></div></div></div></div>	Identifier: '6F30'	Structure: transparent	Optional	File size: 3n (n ≥ 8) bytes	Update activity: low		Access Conditions:			READ	CHV1		UPDATE	CHV1		INVALIDATE	ADM		REHABILITATE	ADM		Bytes	Description	M/O	Length	1 - 3	1 st PLMN (highest priority)	M	3 bytes					22 - 24	8 th PLMN	M	3 bytes	25 - 27	9 th PLMN	O	3 bytes					(3n-2)-3n	n th PLMN (lowest priority)	O	3 bytes
Identifier: '6F30'	Structure: transparent	Optional																																																
File size: 3n (n ≥ 8) bytes	Update activity: low																																																	
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1 - 3	1 st PLMN (highest priority)	M	3 bytes																																															
22 - 24	8 th PLMN	M	3 bytes																																															
25 - 27	9 th PLMN	O	3 bytes																																															
(3n-2)-3n	n th PLMN (lowest priority)	O	3 bytes																																															

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	<p>The “Elementary Files” (HPLMN; PLMNsel; FPLMN) may be updated over-the-air via A SIM data download message, in the form of an SMS or other supported data bearer, referenced in Annex I of 3GPP TS 11.11 and defined in section 7 of 3GPP TS 11.14.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>3GPP TS 11.11 version 8.14.0 Release 1999 173 ETSI TS 100 977 V8.14.0 (2007-06)</p> <hr/> <p>Annex I (informative): EF changes via Data Download or SIM Toolkit applications</p> <p>This annex defines if changing the content of an EF by the network (e.g. by sending an SMS), or by SIM Toolkit Application (e.g. by using the SIM API), is advisable. Updating of certain EFs, "over the air" such as EF_{ACC} could result in unpredictable behaviour of the MS; these are marked "Caution" in the table below. Certain EFs are marked "No"; under no circumstances should "over the air" changes of these EFs be considered.</p> </div> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>3GPP TS 11.14 version 8.18.0 Release 1999 70 ETSI TS 101 267 V8.18.0 (2007-06)</p> <hr/> <p>7 Data download to SIM</p> <p>7.1 SMS-PP data download</p> <p>7.1.1 Procedure</p> <p>If the service "data download via SMS Point-to-point" is allocated and activated in the SIM Service Table (see TS 11.11 [20]), then the ME shall follow the procedure below:</p> <ul style="list-style-type: none"> - When the ME receives a Short Message with: protocol identifier = SIM data download, and data coding scheme = class 2 message, or when the ME receives a Short Message with: protocol identifier=ANSI-136 R-DATA (see 3G TS 23.040 [30]) and data coding scheme = class 2 message, and the ME chooses not to handle the message (e.g. MEs not supporting EGPRS over TIA/EIA-136 do not need to handle the message), <p>then the ME shall pass the message transparently to the SIM using the ENVELOPE (SMS-PP DOWNLOAD) command as defined below.</p> </div>

The '202 Patent	Lenovo Laptops and Tablets with 3G Connectivity
	<p>[Exemplary Sources: http://www.etsi.org/deliver/etsi_ts/100900_100999/100977/08.14.00_60/ts_100977v081400p.pdf; http://shop.lenovo.com/us/en/tablets/thinkpad/thinkpad-10/#tab-tech_specs; http://www.sierrawireless.com/productsandservices/airprime_wireless_modules/essential_modules/~/media/Data%20Sheet/AirPrime_datasheets/Sierra_Wireless_AirPrime_EM_Series.ashx]</p>
<p>a memory coupled to the communication device and operable to store the system identification number list; and</p>	<p>Lenovo's tablets use computer memory to store the EF file received by the tablet. For example, the ThinkPad 10 has on board memory. Lenovo's tablets use the GSM protocol to arrange the EF files.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p>10 Micro-SIM-card slot</p> <p>Open the protective cover to access the micro Subscriber Identification Module (SIM) card slot. Insert a micro SIM card to establish a wireless wide area network (WAN) connection. For instructions on how to install a micro SIM card, see "Installing and removing the micro SIM card" on page 27.</p> </div> <p>The PLMN selector list and forbidden network list are stored on a SIM card.</p> <p>The SIM card incorporates a memory, organized in a directory structure at the lowest level of which the individual files are known as "Elementary Files" ("EF"s) and are stored according to 3GPP TS 11.11.</p>

The '202 Patent	Lenovo Laptops and Tablets with 3G Connectivity		
	<p>6.1 General description</p> <p>Figure 3 shows the general structural relationships which may exist between files. The files are organized in a hierarchical structure and are of one of three types as defined below. These files may be either administrative or application specific. The operating system handles the access to the data stored in different files.</p>  <p>Figure 3: Organization of memory</p> <p>[Exemplary Sources: http://download.lenovo.com/ibmdl/pub/pc/pccbbs/mobiles_pdf/thinkpad_10 Ug_en.pdf; http://www.etsi.org/deliver/etsi_ts/100900_100999/100977/08.14.00_60/ts_100977v081400p.pdf]</p>		
<p>a processor coupled to the memory and operable to access the system identification number list to determine if the mobile unit is authorized to dial out in a particular cellular system service area providing service to the mobile unit.</p>	<p>Lenovo's tablets contain computer processors. The processors are connected to the tablet's memory in order to retrieve data, such as the EF files. The processors read the EF files stored in memory to select an accessible cellular network which the tablets are authorized to access.</p> <table border="1"> <tr> <td>Processor</td><td>Intel Atom Processor Z3795 SoC Quad Core (1.59GHz 1066MHz 2MB)</td></tr> </table> <p>10.3.4 EF_{PLMNsel} (PLMN selector)</p> <p>This EF contains the coding for n PLMNs, where n is at least eight. This information determined by the user/operator defines the preferred PLMNs of the user in priority order.</p>	Processor	Intel Atom Processor Z3795 SoC Quad Core (1.59GHz 1066MHz 2MB)
Processor	Intel Atom Processor Z3795 SoC Quad Core (1.59GHz 1066MHz 2MB)		

The '202 Patent	Lenovo Laptops and Tablets with 3G Connectivity
	<div> <p>2.4 Roaming in shared networks</p> <p>Mechanisms shall be specified to enable flexible allocation of visiting roamers among core network operators that have roaming agreements with the same roaming partners. The core network operators shall be able to pre-define their relative share of visiting roamers and distribute the visiting roamers that apply automatic network selection to different core networks connected to the radio access network accordingly.</p> <p>When network sharing exists between different operators and a user roams into the shared network it shall be possible for that user to register with a core network operator (among the network sharing partners) that the user's home operator has a roaming agreement with, even if the operator is not operating a radio access network in that area.</p> <p>The selection of a core network operator among those connected to the shared radio access network can either be manual (i.e. performed by the user after receiving a list of available core network operators) or automatic (i.e. performed by the UE according to user and operator preferred settings). For further information see subclause 3.2.</p> </div> <div> <p>A) Automatic network selection mode</p> <p>The UE shall select and attempt registration on other PLMNs, if available and allowable, if the location area is not in the list of "forbidden LAs for roaming" and the tracking area is not in the list of "forbidden TAs for roaming" (see 3GPP TS 23.122 [3]), in the following order:</p> <ul style="list-style-type: none"> i) An EHPLMN if the EHPLMN list is present or the HPLMN (derived from the IMSI) if the EHPLMN list is not present for preferred access technologies in the order specified. In the case that there are multiple EHPLMNs present then the highest priority EHPLMN shall be selected. It shall be possible to configure a voice capable UE so that it shall not attempt registration on a PLMN if all cells identified as belonging to the PLMN do not support the corresponding voice service; ii) each entry in the "User Controlled PLMN Selector with Access Technology" data field in the SIM/USIM (in priority order). It shall be possible to configure a voice capable UE so that it shall not attempt registration on a PLMN if all cells identified as belonging to the PLMN do not support the corresponding voice service; iii) each entry in the "Operator Controlled PLMN Selector with Access Technology" data field in the SIM/USIM (in priority order). It shall be possible to configure a voice capable UE so that it shall not attempt registration on a PLMN if all cells identified as belonging to the PLMN do not support the corresponding voice service; iv) other PLMN/access technology combinations with sufficient received signal quality (see 3GPP TS 23.122 [3]) in random order. It shall be possible to configure a voice capable UE so that it shall not attempt registration on a PLMN if all cells identified as belonging to the PLMN do not support the corresponding voice service; v) all other PLMN/access technology combinations in order of decreasing signal quality. It shall be possible to configure a voice capable UE so that it shall not attempt registration on a PLMN if all cells identified as belonging to the PLMN do not support the corresponding voice service. <p>In the case of a UE operating in UE operation mode A or B, an allowable PLMN is one which is not in the "Forbidden PLMN" data field in the SIM/USIM. This data field may be extended in the ME memory.(see subclause 3.2.2.4). In the case of a UE operating in UE operation mode C, an allowable PLMN is one which is not in the "Forbidden PLMN" data field in the SIM/USIM or in the list of "forbidden PLMNs for GPRS service" in the ME.</p> <p>If successful registration is achieved, the UE shall indicate the selected PLMN.</p> </div>

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	<p>The PLMN list defined in section 10.3.4 of 3GPP TS 11.11 “contains the coding for...at least eight (networks). This information determined by the user/operator defines the preferred PLMNs of the user in priority order.”</p> <p>Automatic network selection is mandated in standard 3GPP TS 23.122 – section 3.1. If automatic mode is in use, the tablet attaches to a suitable cell within the selected PLMN providing service to the Fujitsu tablet, as described in section 2 of TS 23.122.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>3.1 PLMN selection and roaming</p> <p>The MS normally operates on its home PLMN (HPLMN) or equivalent home PLMN (EHPLMN). However a visited PLMN (VPLMN) may be selected, e.g., if the MS loses coverage. There are two modes for PLMN selection:</p> <ul style="list-style-type: none"> i) Automatic mode - This mode utilizes a list of PLMNs in priority order. The highest priority PLMN which is available and allowable is selected. ii) Manual mode - Here the MS indicates to the user which PLMNs are available. Only when the user makes a manual selection does the MS try to obtain normal service on the VPLMN. </div> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p>2 General description of idle mode</p> <p>When an MS is switched on, it attempts to make contact with a public land mobile network (PLMN). The particular PLMN to be contacted may be selected either automatically or manually.</p> <p>The MS looks for a suitable cell of the chosen PLMN and chooses that cell to provide available services, and tunes to its control channel. This choosing is known as "camping on the cell". The MS will then register its presence in the registration area of the chosen cell if necessary, by means of a location registration (LR), GPRS attach or IMSI attach procedure.</p> </div> <p>TS22.011 describes the operation of the Fujitsu STYLISTIC® Q702 tablet when registering onto a network (PLMN) for service. Section 3.2.2.1 specifically describes the use of the various ordered lists contained in the operator controlled PLMN list, the use controlled PLMN list and the Home PLMN list.</p>

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	<div style="border: 1px solid black; padding: 10px;"> <p>3.2.2 Procedures</p> <p>3.2.2.1 General</p> <p>In the following procedures the UE selects and attempts registration on PLMNs.</p> <p>In this TS, the term "PLMN Selection" defines an UE based procedure, whereby candidate PLMNs are chosen, one at a time, for attempted registration.</p> <p>A User Controlled PLMN Selector data field exists on the USIM to allow the user to indicate a preference for network selection. It shall be possible for the user to update the User Controlled PLMN Selector data field, but it shall not be possible to update this data field over the radio interface, e.g. using SIM Application Toolkit.</p> <p>It shall be possible to have an Operator Controlled PLMN Selector list and a User Controlled PLMN Selector list stored on the SIM/USIM card. Both PLMN Selector lists may contain a list of preferred PLMNs in priority order. It shall be possible to have an associated Access Technology identifier e.g., E-UTRAN, UTRAN, or GERAN associated with each entry in the PLMN Selector lists.</p> <p style="text-align: center;"><i>ETSI</i></p> <hr/> <p>3GPP TS 22.011 version 11.3.0 Release 11 10 ETSI TS 122 011 V11.3.0 (2013-04)</p> <p>The UE shall utilise all the information stored in the USIM related to network selection, e.g. HPLMN, Operator controlled PLMN Selector list, User Controlled PLMN Selector list, Forbidden PLMN list.</p> <p>Note 1: A PLMN in a Selector list, including HPLMN, may have multiple occurrences, with different access technology identifiers.</p> </div> <p>[Exemplary Sources: http://www.etsi.org/deliver/etsi_ts/100900_100999/100977/08.14.00_60/ts_100977v081400p.pdf; http://www.qtc.jp/3GPP/Specs/23122-8c0.pdf; http://www.etsi.org/deliver/etsi_ts/122000_122099/122011/11.02.00_60/ts_122011v110200p.pdf; http://shop.lenovo.com/us/en/tablets/thinkpad/thinkpad-10/#tab-tech_specs]</p>

The '657 Patent	Lenovo Tablets and Laptops		
Claim 41			
<p>41. A system for communicating a message to a messaging unit using a cellular telephone network, comprising:</p>	<p>Lenovo uses servers and cellular switching centers for communicating messages to their laptops and tablets using cellular telephone networks. After generating software updates, Lenovo uses servers to deliver and install the update messages for its laptops and tablets over cellular networks operated by each device's cellular provider, such as AT&T.</p> <p>Lenovo has a System Update program to facilitate the delivery of these messages on their devices:</p> <table border="1"> <tr> <td>System Update</td><td>Keep the software on your tablet up-to-date by downloading and installing software packages, including Lenovo programs, device drivers, Unified Extensible Firmware Interface (UEFI) basic input/output system (BIOS) updates, and other third-party programs.</td></tr> </table> <p>[Exemplary Source: http://download.lenovo.com/ibmdl/pub/pc/pccbbs/mobiles_pdf/thinkpad_10_ug_en.pdf]</p>	System Update	Keep the software on your tablet up-to-date by downloading and installing software packages, including Lenovo programs, device drivers, Unified Extensible Firmware Interface (UEFI) basic input/output system (BIOS) updates, and other third-party programs.
System Update	Keep the software on your tablet up-to-date by downloading and installing software packages, including Lenovo programs, device drivers, Unified Extensible Firmware Interface (UEFI) basic input/output system (BIOS) updates, and other third-party programs.		
<p>a messaging unit;</p>	<p>Lenovo's laptops and tablets, such as the ThinkPad 10, are messaging units. Lenovo's laptops and tablets connect to wireless cellular networks with radio protocols for data communications.</p> <table border="1"> <tr> <td>Connectivity</td><td> <ul style="list-style-type: none"> ◊ WiFi 802.11 a/b/g/n ◊ Bluetooth 4.0 ◊ Sierra EM7345 LTE </td></tr> </table> <p>[Exemplary Source: http://shop.lenovo.com/us/en/tablets/thinkpad/thinkpad-10/#tab-tech_specs]</p>	Connectivity	<ul style="list-style-type: none"> ◊ WiFi 802.11 a/b/g/n ◊ Bluetooth 4.0 ◊ Sierra EM7345 LTE
Connectivity	<ul style="list-style-type: none"> ◊ WiFi 802.11 a/b/g/n ◊ Bluetooth 4.0 ◊ Sierra EM7345 LTE 		

<p>The '657 Patent</p>	<p>Lenovo Tablets and Laptops</p>
<p>a serving mobile switching center providing service to the messaging unit, wherein the serving mobile switching center comprises a portion of the cellular telephone network;</p>	<p>Lenovo uses mobile switching centers owned and operated by cellular network providers (such as AT&T) to communicate with their laptops and tablets. Lenovo uses the GPRS protocol to facilitate transmittal of its software messages.</p> <div> <h3>5.4 Logical Architecture</h3> <p>GPRS is logically implemented on the GSM structure through the addition of two network nodes, the Serving GPRS Support Node and the Gateway GPRS Support Node. It is necessary to name a number of new interfaces. No inference should be drawn about the physical configuration on an interface from Figure 2.</p> <p>Figure 2: Overview of the GPRS Logical Architecture</p> </div> <p>[Exemplary Source: http://www.etsi.org/deliver/etsi_ts/101300_101399/101344/07.09.00_60/ts_101344v070900p.pdf] </p>

The '657 Patent

a network central controller coupled to the serving mobile switching center, the network central controller having a first database that identifies the serving mobile switching center providing service to the messaging unit; and,

Lenovo Tablets and Laptops

Lenovo uses the network central controllers (NCCs) owned and operated by cellular network providers (such as AT&T) to communicate with their laptops and tablets. The NCCs contain databases identifying the mobile switching center providing service to Fujitsu's laptops and tablets. The cellular network providers use these databases to route messages to and from Lenovo's laptops and tablets.

5.4 Logical Architecture

GPRS is logically implemented on the GSM structure through the addition of two network nodes, the Serving GPRS Support Node and the Gateway GPRS Support Node. It is necessary to name a number of new interfaces. No inference should be drawn about the physical configuration on an interface from Figure 2.

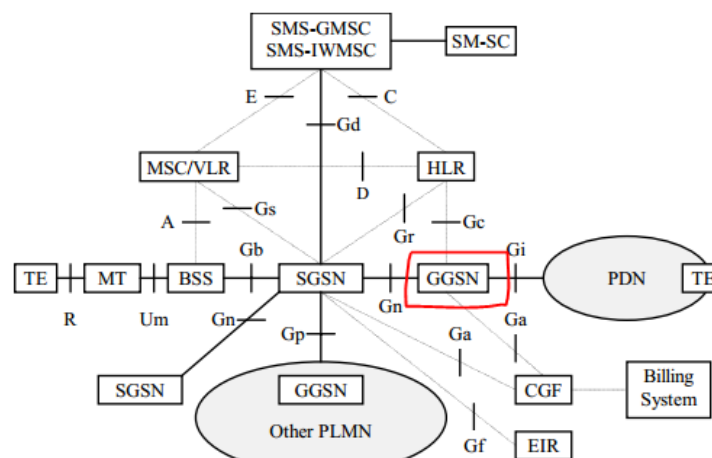
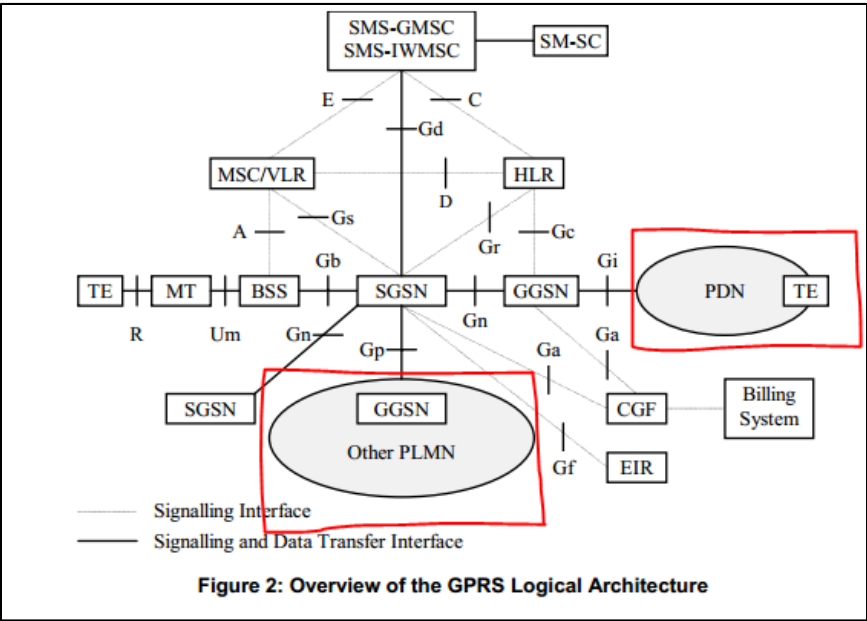
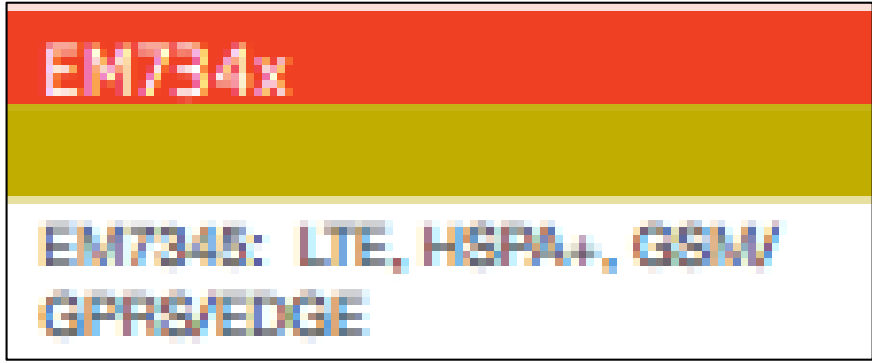


Figure 2: Overview of the GPRS Logical Architecture

The '657 Patent	Lenovo Tablets and Laptops
	<p>The Gateway GPRS Support Node (GGSN) is the node that is accessed by the packet data network due to evaluation of the PDP address. It contains routing information for attached GPRS users. The routing information is used to tunnel N-PDUs to the MS's current point of attachment, i.e., the Serving GPRS Support Node. The GGSN may request location information from the HLR via the optional Gc interface. The GGSN is the first point of PDN interconnection with a GSM PLMN supporting GPRS (i.e., the Gi reference point is supported by the GGSN).</p> <p>[Exemplary Source: http://www.etsi.org/deliver/etsi_ts/101300_101399/101344/07.09.00_60/ts_101344v070900p.pdf]</p>
<p>a device external to the cellular telephone network and coupled to the network central controller by a communication network, wherein the device generates a message for delivery to the messaging unit using the network central controller and the serving mobile switching center of the cellular telephone network and wherein the communication network comprises a global computer network.</p>	<p>Lenovo uses servers to generate and send messages to its laptops and tablets. The servers are external to the cellular telephone network and connected to the cellular providers' NCCs over the Internet or another packet-switched network. The servers generate software update messages for delivery to the laptops and tablets using the NCCs and the mobile switching centers of the cellular network providers.</p>  <p>Figure 2: Overview of the GPRS Logical Architecture</p>

The '657 Patent	Lenovo Tablets and Laptops
	<div style="border: 1px solid black; padding: 5px;"> <p>Every intra-PLMN backbone network is a private IP network intended for GPRS data and GPRS signalling only. A private IP network is an IP network to which some access control mechanism is applied in order to achieve a required level of security. Two intra-PLMN backbone networks are connected via the Gp interface using Border Gateways (BGs) and an inter-PLMN backbone network. The inter-PLMN backbone network is selected by a roaming agreement that includes the BG security functionality. The BG is not defined within the scope of GPRS. The inter-PLMN backbone can be a Packet Data Network, e.g., the public Internet or a leased line.</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>Connecting to a mobile network</p> <p>A micro SIM card is required to connect to a mobile network. Refer to "Installing and removing the micro SIM card" on page 27 for instructions on how to install a micro SIM card.</p> </div> <p>[Exemplary Sources: http://www.etsi.org/deliver/etsi_ts/101300_101399/101344/07.09.00_60/ts_101344v070900p.pdf; http://download.lenovo.com/ibmdl/pub/pc/pccbbs/mobiles_pdf/thinkpad_10_ug_en.pdf]</p>

The '295 Patent	Lenovo Laptops and Tablets with 3G Connectivity						
Claim 38							
<p>38. A messaging unit for data messaging using a cellular telephone network by issuing a feature request, comprising:</p> <p>a sensor operable to generate information;</p>	<p>Lenovo sells laptops and tablets capable of data messaging using cellular telephone networks by issuing feature requests. Lenovo's laptops and tablets generate the feature requests, which contain codes indicating a request and include data representing position information.</p> <p>Lenovo's Tablets, such as the ThinkPad 10, generate position information using GPS receivers. A GPS receiver is a sensor.</p> <div> <table border="1"> <tr> <td>ThinkPad 10</td><td>Tech Specs</td></tr> <tr> <td>Connectivity</td><td> <ul style="list-style-type: none"> ◊ WiFi 802.11 a/b/g/n ◊ Bluetooth 4.0 ◊ Sierra EM7345 LTE </td></tr> <tr> <td colspan="2"> Wireless features <ul style="list-style-type: none"> • Bluetooth 4.0 • Wireless LAN (802.11a/g/n) • Wireless WAN (on some models) • NFC (on some models) • Global Positioning System (GPS) satellite receiver </td></tr> </table> </div>	ThinkPad 10	Tech Specs	Connectivity	<ul style="list-style-type: none"> ◊ WiFi 802.11 a/b/g/n ◊ Bluetooth 4.0 ◊ Sierra EM7345 LTE 	Wireless features <ul style="list-style-type: none"> • Bluetooth 4.0 • Wireless LAN (802.11a/g/n) • Wireless WAN (on some models) • NFC (on some models) • Global Positioning System (GPS) satellite receiver 	
ThinkPad 10	Tech Specs						
Connectivity	<ul style="list-style-type: none"> ◊ WiFi 802.11 a/b/g/n ◊ Bluetooth 4.0 ◊ Sierra EM7345 LTE 						
Wireless features <ul style="list-style-type: none"> • Bluetooth 4.0 • Wireless LAN (802.11a/g/n) • Wireless WAN (on some models) • NFC (on some models) • Global Positioning System (GPS) satellite receiver 							

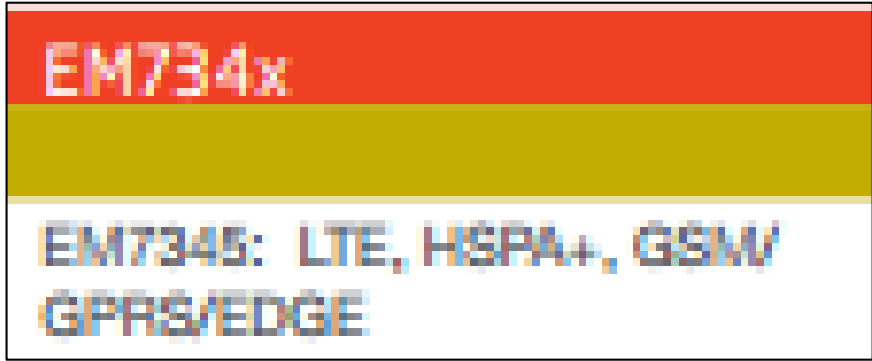
The '295 Patent	Lenovo Laptops and Tablets with 3G Connectivity
	<p>The Lenovo ThinkPad 10 tablet is operable to provide data messaging using 3G and 4G cellular networks.</p> <p>The Lenovo ThinkPad 10 tablet supports 3G operation and is thus compliant with the 3GPP standards defining the associated access network (UTRAN). Description of location-based functions of the module are defined, inter alia, in 3GPP TS 25.305.</p>  <p>[Exemplary Source: http://shop.lenovo.com/us/en/tablets/thinkpad/thinkpad-10/#tab-tech_specs; http://www.sierrawireless.com/productsandservices/airprime_wireless_modules/essential_modules/~/media/Data%20Sheet/AirPrime_datasheets/Sierra_Wireless_AirPrime_EM_Series.ashx; http://download.lenovo.com/ibmdl/pub/pc/pccbbs/mobiles_pdf/thinkpad_10_ug_en.pdf]</p>
<p>a processor coupled to the sensor and operable to receive information generated by the sensor, the processor further operable to generate a feature request having data digits that</p>	<p>Lenovo's laptops and tablets include processors coupled to the GPS receivers that are operable to receive information generated by them.</p> <p>The Lenovo ThinkPad 10 incorporates an Intel processor which implements the logical functionality of the tablet in order to meet the various cellular standards with which the device complies.</p>

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	<div><p>The information that may be signalled from UE to the network is listed in table 10.2.</p><p>Table 10.2: Information that may be transferred from UE to the network</p><table><tr><th>Information</th><th>UE-assisted</th><th>UE-based</th></tr><tr><td>reference time for GPS (T_{UE-GPS}) (specified in [15] and [16])</td><td>Yes</td><td>Yes</td></tr><tr><td>serving cell information</td><td>No</td><td>Yes</td></tr><tr><td>Latitude/Longitude/Altitude/Error ellipse</td><td>No</td><td>Yes</td></tr><tr><td>velocity estimate in the UE</td><td>No</td><td>Yes</td></tr><tr><td>satellite ID for which measurement data is valid</td><td>Yes</td><td>No</td></tr><tr><td>Whole/Fractional chips for information about the code-phase measurement</td><td>Yes</td><td>No</td></tr><tr><td>C/N₀ of the received signal from the particular satellite used in the measurements</td><td>Yes</td><td>No</td></tr><tr><td>doppler frequency measured by the UE for the particular satellite</td><td>Yes</td><td>No</td></tr><tr><td>pseudorange RMS error</td><td>Yes</td><td>No</td></tr><tr><td>multipath indicator</td><td>Yes</td><td>No</td></tr><tr><td>number of Pseudoranges</td><td>Yes</td><td>No</td></tr></table></div>	Information	UE-assisted	UE-based	reference time for GPS (T_{UE-GPS}) (specified in [15] and [16])	Yes	Yes	serving cell information	No	Yes	Latitude/Longitude/Altitude/Error ellipse	No	Yes	velocity estimate in the UE	No	Yes	satellite ID for which measurement data is valid	Yes	No	Whole/Fractional chips for information about the code-phase measurement	Yes	No	C/N ₀ of the received signal from the particular satellite used in the measurements	Yes	No	doppler frequency measured by the UE for the particular satellite	Yes	No	pseudorange RMS error	Yes	No	multipath indicator	Yes	No	number of Pseudoranges	Yes
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a cellular transceiver operable to communicate the feature request	Lenovo’s laptops and tablets contain cellular transceivers operable to communicate the feature requests using the cellular telephone network without opening a voice channel. For example,																																			

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<p>using the cellular telephone network without opening a voice channel.</p>	<p>the Lenovo ThinkPad 10 tablet includes a cellular transceiver operable to communicate via 3G and 4G networks.</p> <p>In 3GPP, positioning requests are received and processed in the network (the "UTRAN" - Universal Terrestrial Radio Access Network) without a voice channel being opened.</p> <p>Data from the device (UE) and one or more base transceiver stations (referred to as Node B's in 3G) are received at a Radio Network Controller (RNC) platform, as described in section 5 of TS 25.305. The RNC in turn interfaces (labelled "lu") to the core network (CN). All of these processes involve data transfer and none requires use of a voice channel.</p> <div> <p>Figure 5.1: General arrangement of UE Positioning in UTRAN</p> </div>

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	<p>[Exemplary Source: http://www.etsi.org/deliver/etsi_ts/125300_125399/125305/11.00.00_60/ts_125305v110000p.pdf]</p>

The '449 Patent	Lenovo Laptops and Tablets with 3G Connectivity						
Claim 38							
<p>38. A messaging unit for data messaging using a cellular telephone network, comprising:</p> <p>a sensor operable to generate information;</p>	<p>Lenovo sells laptops and tablets capable of data messaging using cellular telephone networks by issuing feature requests. Lenovo's laptops and tablets generate the feature requests, which contain codes indicating a request and include data representing position information.</p> <p>Lenovo's tablets, such as the ThinkPad 10, generate position information using GPS receivers. A GPS receiver is a sensor.</p> <div> <table border="1"> <tr> <td>ThinkPad 10</td><td>Tech Specs</td></tr> <tr> <td>Connectivity</td><td> <ul style="list-style-type: none"> ◊ WiFi 802.11 a/b/g/n ◊ Bluetooth 4.0 ◊ Sierra EM7345 LTE </td></tr> <tr> <td colspan="2"> <p>Wireless features</p> <ul style="list-style-type: none"> • Bluetooth 4.0 • Wireless LAN (802.11a/g/n) • Wireless WAN (on some models) • NFC (on some models) • Global Positioning System (GPS) satellite receiver </td></tr> </table> </div>	ThinkPad 10	Tech Specs	Connectivity	<ul style="list-style-type: none"> ◊ WiFi 802.11 a/b/g/n ◊ Bluetooth 4.0 ◊ Sierra EM7345 LTE 	<p>Wireless features</p> <ul style="list-style-type: none"> • Bluetooth 4.0 • Wireless LAN (802.11a/g/n) • Wireless WAN (on some models) • NFC (on some models) • Global Positioning System (GPS) satellite receiver 	
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a processor coupled to the sensor and operable to receive information generated by the sensor, the processor further operable to generate a feature request having data digits that	<p>Lenovo's laptops and tablets include processors coupled to the GPS receivers that are operable to receive information generated by them.</p> <p>The Lenovo ThinkPad 10 incorporates an Intel processor which implements the logical functionality of the module in order to meet the various cellular standards with which the device complies.</p>

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